P518488.PDF [Page: 3 of 15]

Stress and Coping During Canadian Peacekeeping Operations and The Positive and Negative Affect during Sleep Deprivation

Scott J Duggan

2-590 Lawrence Ave West,
Toronto, Ontario
M6A 1A7

W7711-017713/001/TOR

On behalf of
Defence R&D Canada

Defence Research and Development Canada - Toronto

Contract Report

CR 2002-170

2003-01-06

Author

S. J. Duggan

Approved by

M.M. Thompson
Scientific Authority

Approved for release by

K.M. Sutton
Chair, Document Review and Library Committee

© Her Majesty the Queen as represented by the Minister of National Defence, 2002

© Sa majesté la reine, représentée par le ministre de la Défense nationale, 2002

104-05736/

Abstract

This report summarizes the work completed in contract # W771-017713/001/TOR. The purpose of this contract was to organize several large datasets for further statistical analysis. Seven datasets were received providing information about military stress and coping during peacekeeping tours. Consistent and meaningful labels were entered. Missing data and reverse-scored items were recoded. Reliabilities were then run, ensuring the internal consistency of each scale. Finally a correlation matrix was created to compare relevant scales and subscales as a preliminary step in subsequent statistical analyses of the datasets.

In a separate study, personality and PANAS scales were administered in order to investigate changes in self-reports of positive and negative affect across 30 hours of sleep deprivation in a sustained operations context. Data was organized the same way the peacekeeping datasets were. Then the PANAS scale was separated into positive and negative affect. Reliability was run and correlational analyses were conducted as a preliminary step in subsequent analyses of the data.

Résumé

Dans ce document, nous présentons le travail effectué dans le cadre du contrat numéro W771-017713/001/TOR. L'objectif de ce contrat était d'organiser plusieurs grosses bases de données en prévision d'analyses statistiques plus poussées. Nous avons reçu sept ensembles de données sur le stress et l'adaptation des militaires pendant des missions de maintien de la paix. Nous avons attribué à chaque ensemble de données des étiquettes cohérentes et descriptives. Nous avons recodé les réponses pour tenir compte des données manquantes et des échelles inversées. Nous avons testé la fiabilité afin de garantir la cohérence interne de chaque échelle. Nous avons enfin créé une matrice de corrélation permettant de comparer les échelles et les sous-échelles pertinentes, ce qui constitue un premier pas vers les analyses statistiques consécutives des ensembles de données.

Dans le cadre d'une étude indépendante, nous avons administré des tests de personnalité, notamment l'échelle PANAS, pour étudier les changements dans l'autoévaluation des effets négatifs et positifs, au cours d'une période d'opérations soutenues, d'une durée de trente heures, accompagnée d'une privation de sommeil. Nous avons organisé les données en suivant la structure des données sur les casques bleus. Nous avons divisé l'échelle PANAS en affects négatif et positif. Nous avons testé la fiabilité et effectué des analyses de corrélation, ce qui constituait un premier pas vers les analyses statistiques consécutives des données

This page intentionally left blank

P518488.PDF [Page: 7 of 15]

Executive Summary

The purpose of this project was to organize several large-scale data sets for further statistical analysis. For the peacekeeping stress data, seven datasets were received that provided self-report information about military stress and coping during several Canadian Forces peacekeeping tours. The datasets had previously been saved in both *Statistica* and *SPSS* statistical analysis program formats. The *SPSS* data was used. In each of the datasets, consistent and meaningful variable names and labels were used. Finally, all other variables such as "type" and "width" were checked for accuracy and adjusted as needed. Missing data was recoded to "SYSMIS". To determine if any "out of range" data responses were present, simple descriptive analyses were completed. Statistical measures were used to determine the need to recode reverse scored items. Corrected item-total correlations were checked for each of the reverse scored. Once completed reliabilities were run on each variable in an attempt to determine whether or not further analysis might prove useful. Although most scales proved to be reliable, a separate factor analysis was conducted on the "COPE" scale to determine the relevant factors. Items that loaded heavily together were grouped into sub-scales. Analyses were conducted on these sub-scales to ensure sufficient reliability. Then totals were created for all the variable scales. Finally a correlation matrix was created to compare relevant scales and subscales. The data and the preliminary statistics were submitted for further analysis.

For the sleep deprivation study scales were administered at regular intervals to measure a variety of personality scales that included the PANAS Scale. Data files had originally been entered into *Jump* Statistical Analysis program. They were then exported to an *Excel* file and then to an *SPSS* file for organization and further analysis. Once completed checks were conducted to ensure that the data had not been altered during transfer. Then all string variables were converted to numeric variables and all the measures were changed to reflect ordinal level data. Then explanatory value labels, and variable labels were created. Finally, checks were done to look for out of range responses. A sub-scale of the PFI was created. Then reverse-scored items were recoded. Once done, reliabilities were run and mean scores were created for each measure. Then the PANAS scale was separated into positive and negative affect and totals were created for both for each session. Reliability and standard deviations were then conducted on the positive and negative PANAS means. Finally, correlation matrices were created from the totals for positive and negative affect.

Duggan, S.J. 2002. Stress and Coping During Canadian Peacekeeping Operations and The Positive and Negative Affect of Sleep Deprivation. W771-017713/001/TOR. CR 2002-170 Defence Research and Development Canada - Toronto.

Sommaire

L'objectif de ce contrat était d'organiser plusieurs grosses bases de données en prévision d'analyses statistiques plus poussées. Nous avions reçu sept bases de données sur le stress vécu par les casques bleus. Ce sont les réponses à des questionnaires d'autoévaluation sur le stress subit par les militaires canadiens et leurs stratégies d'adaptation pendant des missions de maintien de la paix. Les données étaient conservées dans le format des progiciels d'analyse *Statistica* et *SPSS*. Nous avons choisi les données en format *SPSS*. Nous avons attribué à chaque ensemble de données des étiquettes cohérentes et descriptives. Nous avons vérifié et, au besoin, ajusté toutes les autres variables comme *TYPE* et *WIDTH*. Nous avons attribué aux données manquantes le code *SPSS* « SYSMIS ». Nous avons effectué des analyses descriptives simples, pour déterminer si certaines réponses étaient en dehors de l'intervalle admis. Nous avons effectué des mesures statistiques pour déterminer s'il était nécessaire de recoder les réponses aux items à échelle inversée. Pour chacune de ces questions, nous avons calculé les corrélations entre la question recodée et l'ensemble des questions. Ceci fait, nous avons testé la fiabilité de chaque variable, pour établir si des analyses supplémentaires seraient utiles et nous avons trouvé que la plupart des échelles étaient fiables. Toutefois, nous avons effectué une analyse factorielle distincte pour déterminer quels étaient les facteurs clés de l'échelle « COPE ». Nous avons regroupé en sous-échelles, les items fortement corrélés. Nous avons exécuté des analyses sur ces sous-échelles pour garantir qu'elles étaient suffisamment fiables, puis nous avons créé des totaux pour toutes les échelles variables. Pour finir, nous avons créé une matrice de corrélation pour comparer les échelles et les sous-échelles pertinentes. Nous avons soumis les données et les statistiques préliminaires à des analyses supplémentaires.

Lors de l'étude sur le manque de sommeil, nous avons administré périodiquement différents tests pour évaluer diverses dimensions de la personnalité, notamment l'échelle PANAS. Les données ont d'abord été entrées dans le programme d'analyse statistique *JUMP*. Elles ont ensuite été exportées, sous la forme d'un fichier *Excel*, puis transformées en fichier *SPSS*, pour en faciliter la manipulation et l'analyse plus poussée. Nous avons effectué des vérifications pour nous assurer que le transfert n'avait pas modifié les données. Nous avons alors converti toutes les variables alphanumériques en valeurs numériques et avons transformé toutes les mesures pour les placer sur une échelle ordinale. Nous avons créé des codes descriptifs pour les valeurs et les variables. Finalement, nous avons contrôlé s'il y avait des réponses plus grandes ou plus petites que l'intervalle admis. Nous avons créé une sous-échelle pour la mesure de la « Peur de commettre une erreur » (l'indice *PFI*). Nous avons ensuite recodé les réponses aux items à échelle inversée. Après ceci, nous avons testé la fiabilité et créé des scores moyens pour chaque mesure. Nous avons alors divisé l'échelle PANAS en affects positif et négatif et, pour chaque session, calculé le total de chacun. Nous avons établi la constance et les écarts-types pour les moyennes négatives et positives de l'échelle PANAS. Pour finir, nous avons construit les matrices de corrélation à partir des totaux des affects négatif et positif.

Duggan, S.J. 2002. Stress and Coping During Canadian Peacekeeping Operations and The Positive and Negative Affect of Sleep Deprivation. W771-017713/001/TOR. CR 2002-170 Defence Research and Development Canada - Toronto.

Table of contents

Abstract i

Résumé i

Executive Summary i

Sommaire ii

Table of contents iii

Aim 1

Peacekeeping Stress Data 1

Background 1

Data Transfer 1

Organization 1

Recoding of Reverse Scored Items 2

Sleep Deprivation Affect Data 3

Background 3

Data Transfer 3

Organization 3

Creation of New Personal Fear of Invalidity Sub-Scale 3

Recoding of Reverse Scored Items 4

Preliminary Statistical Analysis 4

Aim

The purpose of this report is to summarize the work completed within contract number: W771-017713/001/TOR. The title of the project was Sleep Deprivation, and as such a segment of it was related to that study. The other segments were related to Canadian Forces peacekeeping stress data.

Peacekeeping Stress Data

Background

The datasets received provided information about military stress and coping before, during and after several Canadian Forces peacekeeping tours. The data collection method was self-report, meaning that individuals were given questions and were asked to be as honest as possible. There were seven datasets which represented different phases and time frames, and were labelled: Tour 1 - Phase 1, Tour 1 - Phase 2, Tour 1 – Phase 3, Tour 1 – Post, Tour 2 – Phase 2, Tour 3 – Pre, and Tour 3 – Phase 1*. In each case, a variety of questionnaires were used. These included the Unit Climate Profile, COPE Scale, Experience of Stress (before, during and after deployment), Family, Homecoming Issues, Perceived Organizational Support, Positive Aspects of Peace Operations, Service Experience Scale, Signs, Stress in Military Service, Stress in Peace Operations, and The Tour in Perspective. Unfortunately, not all questionnaires were included in each administration. This made for difficulties during data analysis. Another problem was that the order and inclusion of the questions within each questionnaire was not kept constant; again making analysis difficult. Finally, there is no way to know if any of the information received was from the same individual or group of individuals across data sets.

Data Transfer

The datasets had previously been saved in both *Statistica* and *SPSS* statistical analysis program formats. There had been more labelling and preliminary analysis done in *Statistica*. However, since *SPSS* was the preferred statistical package, and because of concerns transferring data from *Statistica* to *SPSS*, the previous *SPSS* data was used. The hard copy of how the data was organized within *Statistica*, however, did prove helpful. With this decided, the data could be collated and organized.

Organization

In each of the datasets, ambiguous variable labels were used for each scale. This made it difficult to know what scale they were from unless a variable guide was

* Actual file names were altered to ensure anonymity.

included. To correct this problem, variable labels were changed to reflect what the actual scale was meant to measure. For example, the Unit Climate Profile had previously been labeled as variable "H". It was now changed to "UNIT". These labels remained consistent across datasets. Many variable names were also either ambiguous or missing. Again consistent and meaningful names were used. Existing Value labels were verified and where added when such labels had been omitted. A list of variable names, variable labels and value labels can be found in Appendix A. Finally, all other variables such as "type", "width", "decimals", "columns", "align" and "measure" were checked for accuracy and adjusted as needed. For example, "measure" refers to scale type. Some ordinal level data was incorrectly entered as nominal level data. This severely limits statistical analysis.

With regards to missing data, the original *SPSS* files coded it as "999". For ease of analysis later on, it was recoded to "SYSMIS". To determine if any "out of range" data responses were present, simple descriptive analyses were completed. Frequencies were run which indicated the number of respondents who chose each answer (value). When there was a number instead of a value in the output field, the response for that individual for that question was omitted. There didn't seem to be a consistent pattern of either "missing" or "out of range" data. Notes were made to address missing data, and other anomalies. These notes are attached in Appendix B.

Recoding of Reverse Scored Items

Reverse scored items presented a special challenge in that there was no way to know if such items had been, or needed to be reverse scored. Further analysis could not be completed until such information was obtained. Since there was no way to contact the individual responsible for the initial data entry, statistical measures were used to accomplish this task. For each variable, a scale reliability analysis was run. Corrected item-total correlations were checked for each of the reverse scored items. If the correlations for such items were negative or close to zero, as a group, then the items needed to be recoded to reflect the reverse scoring. When this was completed, another reliability analysis was run to ensure that the correlations were indeed positive and farther from zero.

Preliminary Statistical Analysis

Once the data was organized, verified, and recoded, reliabilities were run on each variable in an attempt to determine whether or not further analysis might prove useful. First, overall reliabilities were conducted for each variable. Then, if applicable, sub-scale reliabilities were conducted. Those that showed significant reliability would be analyzed further. All reliability analyses are included in Appendix C. The "Cope" scale proved more difficult to analyze. This is because there were a number of factors included in the scale that needed to be separated and analyzed separately. Therefore a factor analysis was conducted to determine the relevant factors. Items that loaded heavily together were grouped into sub-scales. Analyses were conducted on these sub-scales to ensure sufficient reliability. Then totals were created for all the variable scales. Finally a correlation matrix was created to compare relevant scales and

subscales. The data and the preliminary statistics were submitted for further analysis. This correlation matrix can be found in Appendix D.

Sleep Deprivation Affect Data

Background

Data for the sleep deprivation study was collected between April 26, 1999 and June 21, 2000. There were 16 teams of 4 subjects each. Eight of the teams were military reservists from the greater Toronto area. Eight of the teams were university students. Scales were administered at regular intervals during the experiment. The scales used were: The Personal Need for Structure Scale, The Personal Need for Cognition Scale, The Personal Fear of Invalidity Scale, the Big Five Index (neuroticism, agreeableness, openness, extroversion and conscientiousness), The Mastery Scale, and The PANAS Scale.

Data Transfer

The data had originally been entered into *Jump* Statistical Analysis program. Unfortunately it was not possible to convert these files directly into *SPSS*. Therefore it was necessary to copy the data into an *Excel* file. The *Excel* file was then imported to *SPSS* for organization and further analysis.

Organization

Once the data was converted to an *SPSS* file, several checks were conducted to ensure that the data had not been altered during transfer. When this was complete, all string variables were converted to numeric variables and all the measures were changed to reflect ordinal level data. Then explanatory value labels, and variable labels were created. Finally, similar to the procedure for the peacekeeping data sets, the data was checked for out of range responses. None were found.

Creation of New Personal Fear of Invalidity Sub-Scale

A sub-scale of the PFI was created. This involved making a copy of the following original PFI variables: PFI14 to PFI27 and PFI36, and renaming them PFI14new to PFI27new and PFI36new.

Recoding of Reverse Scored Items

In the original data, no reverse scored items had been recoded. A list, however, of the items requiring recoding was provided. Therefore a syntax file was created to recode the necessary items.

Preliminary Statistical Analysis

Once all of the organizing and recoding of the data was completed, reliabilities were run and mean scores were created for each measure. These can be found in Appendix E. The next step was to separate the PANAS scale into positive and negative affect. Then totals were created for both for each session. Reliability analyses were then conducted on the positive and negative PANAS means (Appendix F). Standard deviations were also calculated for both positive and negative affect of the PANAS scale (Appendix G). Finally, correlation matrices were created from the totals for positive and negative affect (Appendix H).

DOCUMENT CONTROL DATA SHEET

1a PERFORMING AGENCY	2 SECURITY CLASSIFICATION
Mr Scott Duggan, 2-590 Lawrence Ave West, Toronto, Ontario M6A 1A7	UNCLASSIFIED Unlimited distribution -
1b PUBLISHING AGENCY DRDC Toronto	

3 TITLE

(U) Stress and Coping during Canadian Peacekeeping Operations and the Positive and Negative Affect of Sleep Deprivation

4 AUTHORS

Scott J. Duggan

5 DATE OF PUBLICATION	6. NO OF PAGES
September 15 , 2002	14

7 DESCRIPTIVE NOTES

8 SPONSORING/MONITORING/CONTRACTING/TASKING AGENCY
Sponsoring Agency
Monitoring Agency
Contracting Agency
Tasking Agency

9 ORIGINATORS DOCUMENT NO	10 CONTRACT GRANT AND/OR PROJECT NO	11 OTHER DOCUMENT NOS
Contract Report 2002-170	W7711-017713/001/TOR	

12 DOCUMENT RELEASABILITY

Unlimited distribution

13. DOCUMENT ANNOUNCEMENT

Unlimited announcement

14 ABSTRACT

(U) This report summarizes the work completed in contract # W771-017713/001/TOR. The purpose of this contract was to organize several large datasets for further statistical analysis. Seven datasets were received providing information about military stress and coping during peacekeeping tours. Consistent and meaningful labels were entered. Missing data and reverse-scored items were recoded. Reliabilities were then run, ensuring the internal consistency of each scale. Finally a correlation matrix was created to compare relevant scales and subscales as a preliminary step in subsequent statistical analyses of the datasets.

In a separate study, personality and PANAS scales were administered in order to canadain investigate changes in self-reports of positive and negative affect across 30 hours of sleep deprivation in a sustained operations context. Data was organized the same way the peacekeeping datasets were. Then the PANAS scale was separated into positive and negative affect. Reliability was run and correlational analyses were conducted as a preliminary step in subsequent analyses of the data

(U)

#518488

15. KEYWORDS, DESCRIPTORS or IDENTIFIERS

(U) stress and coping; Canadian Forces; Peacekeeping